

I. AMENDMENTS TO THE CLAIMS

Claim 1. (Previously Presented) Porous hydrophilic membranes comprising a porous inert support on which at least one ionomer is deposited, wherein the membranes have a water permeability higher than $1 \text{ l}/(\text{h} \cdot \text{m}^2 \cdot \text{Atm})$, and wherein the ionomer is amorphous and comprises acid hydrophilic groups.

Claim 2. (Previously Presented) Membranes according to claim 1, comprising pores partially or totally occluded to gases.

Claim 3. (Previously Presented) Membranes according to claim 2, comprising pores totally occluded to gases and an ionomer amount higher than about 30% by weight.

Claim 4. (Previously Presented) Membranes according to claim 2, comprising pores totally occluded to gases and an ionomer amount higher than about 20% by weight.

Claim 5. (Previously Presented) Membranes according to claim 1, wherein the porous inert support is formed by (per)fluoropolymers.

Claim 6. (Currently Amended) Membranes according to claim 1, wherein the ionomer is a (per)fluorinated polymer preferably comprising $-\text{SO}_3\text{H}$ and/or $-\text{COOH}$.

Claim 7. (Previously Presented) Membranes according to claim 6, wherein the ionomer comprises:

- (A) monomeric units deriving from one or more fluorinated monomers containing at least an ethylene unsaturation; or
- (B) fluorinated monomeric units containing functional groups selected from the group consisting of one or more of $-\text{SO}_2\text{F}$, $-\text{COOR}$, and $-\text{COF}$, wherein R is a C_1 to C_{20} alkyl radical or a C_6 to C_{20} aryl radical, and wherein the functional groups are converted into one or more of hydrophilic groups $-\text{SO}_3\text{H}$ or $-\text{COOH}$ in the final membrane.

Claim 8. (Currently Amended) Membranes according to claim 7, wherein the fluorinated monomeric units (A) are selected from the group consisting of:

- vinylidene fluoride (VDF);
- C₂ to C₈ perfluoroolefins;
- C₂ to C₈ chloro, bromo- and/or iodo-fluoroolefins;
- CF₂=CFOR_f (per)fluoroalkylvinylethers (PAVE), wherein R_f is a C₁ to C₆ (per)fluoroalkyl; and
- CF₂=CFOX perfluoro-oxyalkylvinylethers, wherein X is a C₁ to C₁₂ perfluoro-oxyalkyl having one or more ether groups.

Claim 9. (Previously Presented) Membranes according to claim 7, wherein the fluorinated monomeric units (B) are selected from the group consisting of:

- F₂C=CF-O-CF₂-CF₂-SO₂F;
- F₂C=CF-O-[CF₂-CXF-O]_n-CF₂-CF₂-SO₂F, wherein X = Cl, F or CF₃ and n = 1 to 10;
- F₂C=CF-O-CF₂-CF₂-CF₂-SO₂F;
- F₂C=CF-Ar-SO₂F wherein Ar is an aryl ring;
- F₂C=CF-O-CF₂-CF₂-CF₂-COF; and
- F₂C=CF-O-[CF₂-CXF-O]_n-CF₂-CFX-COF, wherein X = Cl, F or CF₃ and n = 1 to 10.

Claim 10. (Previously Presented) Membranes according to claim 1, wherein the ionomer contains from 0.01% to 5% by moles of monomeric units deriving from a bis-olefin of formula:



wherein:

m = 2 to 10 ; and

R₁, R₂, R₅, and R₆ are equal to or different from each other and are H or C₁ to C₅ alkyl groups.

Claim 11. (Previously Presented) Membranes according to claim 1, wherein the at least one ionomer is selected from the group consisting of one or more of the following monomers:

- monomeric units deriving from TFE;
- monomeric units deriving from $\text{CF}_2=\text{CF}-\text{O}-\text{CF}_2\text{CF}_2\text{SO}_2\text{F}$;
- monomeric units deriving from the bis-olefin of formula (I); and
- iodine atoms in end position.

Claim 12. (Previously Presented) Membranes according to claim 1, wherein the ionomer shows a substantial absence of crystallinity.

Claim 13. (Previously Presented) Membranes according to claim 12, wherein the ionomer has a residual crystallinity lower than 5%.

Claim 14. (Previously Presented) Membranes according to claim 6, wherein the (per)fluorinated ionomer is crosslinked.

Claim 15. (Currently Amended) Membranes according to claim 1, containing, ~~besides the amorphous ionomer comprising acid hydrophilic groups,~~ one or more amorphous or crystalline (per)fluoropolymers, wherein the amorphous (per)fluoropolymers are one or more (per)fluoroelastomers selected from one or more of the group consisting of TFE/(per)fluorovinylether copolymers, TFE/VDF/HFP, and (per)fluorovinylether.

Claim 16. (Original) Membranes according to claim 15, wherein the (per)fluoropolymers are of crystalline ionomeric type.

Claim 17. (Currently Amended) A method of separating ~~utilizing water from aqueous solutions, by contacting said solutions with~~ the membranes according to claim 1.

Claim 18. (Previously Presented) The method according to claim 17, wherein the method is iperfiltration or reverse osmosis and wherein the membranes comprise pores totally occluded to gases and contain an ionomer amount higher than about 30% by weight.

Claim 19. (Previously Presented) A process for preparing hydrophilic porous membranes according to claim 1, comprising a porous support formed by a (per)fluorinated polymer, and amorphous (per)fluorinated ionomers containing hydrophilic groups, selected from the group consisting of $-\text{SO}_3\text{H}$ and $-\text{COOH}$, said process comprising:

- a) impregnating the porous support with a (per)fluorinated ionomer solution in fluorinated organic solvent,

wherein:

the (per)fluorinated ionomer comprises hydrolyzable groups, selected from the group consisting of $-\text{SO}_2\text{F}$, $-\text{COOR}$, and $-\text{COF}$, wherein R is a C_1 to C_{20} alkyl radical or a C_6 to C_{20} aryl radical,

the concentration of the ionomer in the range 1% to 20% by weight, and
the impregnating is carried out at a temperature in the range of from room temperature to 120°C until the membrane comprises pores substantially filled by the solution;

- b) subjecting the impregnated membrane to thermal treatment at temperatures from 50°C to 200°C , until the solvent is substantially removed and the membrane is substantially transparent;
- c) optionally repeating until the membrane appears substantially transparent;
- d) treating the membrane with inorganic strong aqueous alkali to convert the functional groups into hydrophilic groups;
- e) treating the membrane with inorganic strong acids, to convert the (per)fluorinated ionomer to acid hydrophilic form;
- f) optionally treating with water at a temperature in the range of 50°C to 100°C to remove the excess ionomer .

Claim 20. (Previously Presented) The process according to claim 19, wherein the organic solvent has a boiling point at room pressure lower than 180°C .

Claim 21. (Previously Presented) The process according to claim 19, wherein the alkali is a hydroxide of Group Ia metals.

Claim 22. (Currently Amended) The process according to claim 19, wherein the treating with water is carried out until the water has a neutral pH.

Claim 23. (Previously Presented) The process according to claim 19, wherein the ionomer is crosslinked by adding cross-linking agents to the (per)fluorinated ionomer solution.

Claim 24. (Previously Presented) The process according to claim 23, wherein the cross-linking agents are peroxides, and wherein the temperature of a cross-linking reaction is from 100°C to 300°C.

Claim 25. (Previously Presented) The method of claim 17, wherein the method of separation is microfiltration or ultrafiltration of aqueous solutions.

Claim 26. (Currently Amended) The method of ~~claim 17~~ claim 27, wherein the method of ~~separation~~ dehydrating is pervaporation.

Claim 27. (New) A method of dehydrating humid gases comprising contacting said gases with the membranes of claim 4.